

# **Update to Proposal for an Experiment to Measure Mixing, CP Violation and Rare Decays in Charm and Beauty Particle Decays at the Fermilab Collider - BTeV\***

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- G.Y. Drobychev, A.S. Lobko, A.R. Lopatik and R.F. Zouevsky  
Belarussian State University, National Science and Education Center, 240040, Minsk
- J. Link and P. Yager  
University of California at Davis, Exp. High Energy Group, One Shields Ave.,  
Davis CA 95616-8677 USA
- J. Cumalat  
University of Colorado, High Energy Physics, Campus Box 390,  
Boulder, CO 80309, USA
- J. A. Appel, E. Barsotti, C. N. Brown, J. Butler, H. Cheung, G. Chiodini, D. Christian,  
S. Cihangir, R. Coluccia, I. Gaines, P. Garbincius, L. Garren, E. E. Gottschalk,  
A. Hahn, G. Jackson, P. Kasper, P. H. Kasper, R. Kutschke, S. W. Kwan, P. Lebrun,  
P. McBride, M. Votava, M. Wang, and J. Yarba  
Fermilab, PO Box 500, Batavia, IL 60510, USA
- P. Avery  
University of Florida, Gainesville, FL 32611, USA
- M. Bukhari, K. Lau, B.W. Mayes, V. Rodriguez, and S. Subramania  
University of Houston, Houston, TX 77204-5506, USA
- R.A. Burnstein, D.M. Kaplan, L.M. Lederman, H.A. Rubin, and C. White  
Illinois Institute of Technology, Chicago, IL 60616, USA
- M. Haney, D. Kim, M. Selen, and J. Wiss  
University of Illinois at Urbana-Champaign, High Energy Physics,  
441 Loomis Lab. of Physics, 1110 W. Green St., Urbana, IL 61801-3080, USA
- R. W. Gardner and D. R. Rust  
Physics Department, Indiana University, Bloomington, Indiana, 47405, USA
- M. Bertani, L. Benussi, S. Bianco, M.A. Caponero, F. Fabbri, A. Felli, M. Giardoni,  
A. LaMonaca, E. Pace, M. Pallotta and A. Paolozzi  
INFN - Laboratori Nazionali di Frascati, CP 13, via E. Fermi 40,  
1-00044, Frascati, Roma, Italy
- G. Alimonti, P. D'Angelo, L. Edera, S. Erba, S. Magni, D. Menasce, L. Moroni,  
D. Pedrini, S. Sala and L. Uplegger  
INFN and University of Milano, Italy
- G. Boca, G. Liguori, and P. Torre

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\*Spokespersons: Joel Butler and Sheldon Stone

- INFN - Pavia, Dipartimento di Fisica Nucleare e Teorica, Universita' di Pavia,  
Sez. di Pavia, Italy
- R. Arcidiacono, S. Argiro, S. Bagnasco, N. Cartiglia, R. Cester, F. Marchetto  
E. Menichetti, R. Mussa, and N. Pastrone  
INFN - Uni. degli Studi di Torino; Dipt. di Fisica Teorica,  
via Pietro Giuria 1; 1-10125, Torino, Italy
- A. A. Derevschikov, Y. M. Goncharenko, V. Yu. Khodyrev, V. Kravtsov, A. P. Meschanin,  
V. Mochalov, D. Morozov, L. V. Nogach, P. Semenov, K. E. Shestermanov, L. F. Soloviev,  
A. Uzunian and A. N. Vasiliev  
Institute of High Energy Physics (IHEP), Protvino, Moscow Region, Russia
- P. Ratcliffe and M. Rovere  
University of Insubria in Como
- C. Newsom and R. Brauner  
The University of Iowa, Department of Physics & Astronomy,  
Iowa City, IA 52242-1479
- V. V. Frolov, Y. Kubota, R. Poling, and A. Smith  
University of Minnesota, High Energy Physics, Tate Laboratory of Physics,  
116 Church St. S.E., Minneapolis, MN 55455, USA
- T. Y. Chen, D. Gao, S. Du, Ming Qi, B.P. Zhang, Z. Xi Zhang, and J.W. Zhao  
Nanjing University, Dept. of Physics, Nanjing 210008, China
- V. Papavassiliou  
New Mexico State University
- K. Honscheid, and H. Kagan  
Ohio State University, HEP Group, Dept. of Experimental or Theoretical Physics,  
Smith Lab, 174 W. 18th Ave., Columbus, OH 43210, USA
- W. Selove  
University of Pennsylvania, Philadelphia, PA 19104, USA
- A. Lopez and W. Xiong  
University of Puerto Rico, Mayaguez, Puerto Rico
- G. Datao, L. Hao, Ge Jin, T. Yang and X.Q. Yu  
University of Science and Technology of China, Department of Modern Physics,  
Joint Institute for High Energy Physics, Hefei, Anhui 230027, China
- C.F. Feng, Yu Fu, Mao He, J.Y. Li, L. Xue, N. Zhang, and X. Y. Zhang  
Shandong University, High Energy Physics Group; Jinan, Shandong 250100, China
- T. Coan  
Southern Methodist University, Dallas, TX 75275, USA
- M. Alam  
State University of New York at Albany,  
Dept. of Physics, Albany, NY 12222, USA
- M. Artuso, S. Blusk, C. Boulahouache, O. Dorjkhaidav, K. Khoustalev,  
R. Mountain, R. Nandakumar, T. Skwarnicki, S. Stone, J. C. Wang, and H.W. Zhao  
Syracuse University, 201 Physics Bldg., Syracuse, NY 13244-1130, USA

K. Cho, T. Handler and R. Mitchell  
University of Tennessee, Knoxville, TN 37996-1200, USA

A. Napier  
Tufts University, High Energy Physics, Science & Technology Center,  
4 Colby St., Medford, MA 02155, USA

W. Johns, P. Sheldon, K. Stenson, Vaandering, and M. Webster  
Vanderbilt University, Department of Physics and Astronomy,  
Nashville, TN 37235, USA

M. Arenton, S. Conetti, B. Cox, and A. Ledovskoy  
University of Virginia, High Energy Physics Group, Charlottesville, VA 22901, USA

G. Bonvicini, D. Cinabro, and A. Schreiner  
Wayne State University, Department of Physics and Astronomy,  
666 W. Hancock, Detroit, MI 48202, USA

M. Sheaff  
University of Wisconsin, Phenomenology Inst., Dept. of Physics,  
1150 University Ave., Madison, WI 53706, USA

J. Slaughter  
Yale University, High Energy Physics, 219 Prospect St.,  
554 JWG, Box 6666, New Haven, CT 06511, USA

S. Menary  
York University, Dept. of Physics  
4700 Keele St., Toronto, ON M3J 1P3, Canada

## Summary of Submitted Documents

We have been requested to submit an update of the BTeV plan to the Fermilab Physics Advisory Committee, where to save money the detector has only one arm and there is no new interaction region magnet construction planned. These are to come from a currently running collider experiment at the appropriate time.

The “Physics Case” section is complete and updated with the section on the “New Physics” capabilites of BTeV greatly expanded. We show that precise measurments of rare flavor-changing neutral current processes and CP violation are and will be complementary to the Tevatron and LHC to unraveling the electroweak breaking puzzle.

We include a revised summary of the physics sensitivities for the one-arm detector, which are not simply taking our proposal numbers and dividing by two, because of additional improvements. One important change resulted from an improved understanding of just how important the RICH detector is to muon and electron identification, that we can indeed separate electrons from pions and muons from pions, especially at relatively large angles beyond the physical appature of the EM calorimeter or the Muon Detector. This is documented in the “Physics Sensitivities” section.

The section on the detector includes the motivation for doing  $b$  and  $c$  physics at a hadron collider, and shows the changes in the detector since the proposal based on our ongoing R&D program. We do not here include a detailed description of the entire detector. That is available in the May, 2000 proposal.<sup>2</sup> We include a summary of our R&D activities for the entire experiment.

Finally, we also include a fully updated cost estimate for the one-arm system.

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<sup>2</sup>[http://www-btev.fnal.gov/public\\_documents/btev\\_proposal/index.html](http://www-btev.fnal.gov/public_documents/btev_proposal/index.html)